Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

New Personal Communications Services	)	Gen. Docket No. 92-333
	)	Gen. Docket No. 90-314
	)	ET Docket 92-100
Reply to Comments on Proposed Rule Making from Telmarc Telecommunications Inc.	)	January 8, 1993

REPLY TO COMMENTS ON NOTICE OF PROPOSED RULE MAKING

POSITION SUMMARY

Pursuant to the Commission's Notice of Public Rulemaking (NPRM), relating to the Commission's General Docket 92-333, and General Docket No. 90-314, the Commentor, Telmarc Telecommunications Inc., hereby provides reply to comments on the set of proposed rulemaking for the proposed allocations of spectrum for PCN, Personal Communications Networks.

The Commentor has either reiterated or refocused its prior comments on two issues; that of a national license and that of the issues of scale and scope.

1. The Commentor has previously introduced, supported , developed, initiated, and implemented a National Consortium to demonstrate, via a National Trial, that the Goal of a seamless interoperable national network is achievable without the issuance of a single license to a single company. As such, the Commentor is in essential agreement with the proposal made by MCI in its comments to the Commission on the NPRM for PCN. The Commentor further takes the position that any such Consortium should be fairly and equitable represented by all of its members and that the management of such a network should and must be the responsibility of its members in concert. The issuance of a license to a single consortium dominated by any single entity is prima facie the issuance of a national license to a

single entity, such position having been argued as opposing the Goal and potentially being anti-competitive. In effect, any Consortium having a dominant single national member has the essence of a chilling effect on the introduction of new technology and the openness, from a market perspective, for full entrepreneurial competitiveness.

2. The Commentor has previously shown that PCS lacks economies of both scale and scope, and that therefore there are de minimis barriers to entry. The Commentor hereby opposes the general conclusions Commission's analysis demonstrating economies of scope as being a reflection of a past paradigm of implementation and failing to reflect the impact that technology can and will have on PCN. This position of the Commentor is consistent with and further supports its overall position on National Consortium and National licenses, since without significant economies of scope, no single dominant player can or will bring public policy benefits to the systems proposed. As such, the Commentor rejects the Commission's analysis as a sweeping generality and suggests a new study by the Commission that takes into account true operational issues and the impacts of new and innovative technologies. The results clearly go to the heart of the National License proposal.

PRIOR POSITIONS ON A NATIONAL SYSTEM

The Commentor had taken a position in earlier filings with the Commission, in both the matter of the NPRM as well as the matter of Pioneer Preference, with regard to National Licenses and the overall licensing process. A recent filing to the Commission in the matter of the NPRM by MCI has recommended a National license be awarded on a comparative hearing basis to a National Consortium. The Commentor takes this opportunity to support the essence of this proposal and to do so in a broader policy context than was taken by the MCI Filing.

The Commentor had previously provided the Commission with a Goal for the entire PCS process that was consistent with the Commission's prior Notices and actions but not having been clearly and unambiguously articulated by the Commission.[1] This Goal addressed the concern of the Commission about having a "seamless interoperable National network" and how that might best be achieved. At the time of the first set of comments the Commission could see that being done in only two ways; by having a single company having a single license, or by the Commission entering into the process of establishing a national standard. The latter approach was admitted to be an excessively long and drawn out process that could encumber technological initiative and the former being a choice that could seriously delimit the process of innovation and competition.

In the Commentor's Reply to Comments on the Pioneer Preference filings, the Commentor Proposed a National Coalition, as a vehicle to loosely bind together several of the major entities, and in that venue allow for the development of standards and interfaces. The recommendation of the Commentor was based upon the fact that free market forces, managed by clear and unambiguous policy guidelines, can and have developed the most competitive and effective systems in prior cases. Thus the Commentor suggested that the Coalition be formed and set about doing so. [2]

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1. In the Telmarc Telecommunications Reply to Comments on the Pioneer Preference Filings on June 25, 1992, the Petitioner, PP-76, stated the following as to the Goal of PCS:

   "1. GOAL

   THE GOAL OF THE ESTABLISHMENT OF NEW PCN SERVICES IS TO PROVIDE TO THE PUBLIC, SEAMLESS AND INTEROPERABLE WIRELESS TELECOMMUNICATIONS SERVICES THAT USE THE MOST INNOVATIVE TECHNOLOGY AND TECHNIQUES AND PROVIDED IN AS COMPETITIVE ENVIRONMENT AS POSSIBLE, TO ENSURE THE MAXIMUM BENEFIT TO THE CONSUMER."

2. In the Telmarc Telecommunications Reply to Comments on the Pioneer Preference Filings on June 25, 1992, the Petitioner, PP-76, stated the following as to the options available to achieve the Goal of PCS:

   " OPTION 5.1

   IN AN OPEN-MARKET ALTERNATIVE, AGREEMENT TO STANDARDS CAN EVOLVE WITHIN A LOOSE COALITION OF THE SAME-BAND PROVIDERS IN DIFFERENT CITIES.

The Commentor continued to pursue the concept of a National Consortium and was pleased to see, in the November 9, 1992 filing of MCI, a concept of similar structure but with MCI playing a more significant role. The Commentor had also reiterated their position in that NPRM response. [3] Also, the Commentor had filed

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Loose national coalitions are very typical. For example, in the 800 MHz band the Cellular One coalition is a Branding approach that includes commonality of some service offerings. If a similar approach could evolve around common technology alternatives, then allocation to loose coalitions is one approach to balance innovation and competition, with the needs for seamless service and interoperability. It is suggested that such a natural clustering of interests is possible and that the Commission should support this. This approach should be aggressively supported in two ways. First, filings on consortia should receive further preference, and second, the anti-competitive nature of such coalitions, delimited by antitrust laws should be reviewed and consideration made to allow such an approach that will be within the context of the overall public interest. The present Petitioner has, with other petitioners, agreed to amend their Experimental filings to demonstrate that using QUALCOMM CDMA technology that a national network is achievable. These amendments will be forthcoming, and clearly demonstrate the ability to coalesce around a single standard.

OPTION 5.2

IN AN OPEN MARKET ALTERNATIVE, FULL FREE MARKET FORCES WILL BE USED TO ALLOW THE CONSUMER TO DETERMINE THE BEST SOLUTION, PROVIDING NO GUIDELINES TO SERVICE PROVIDERS.

A full free and open market will not be stable and cannot effectively exist. **The natural instability of this approach suggests that it not be followed.**

6.0 RECOMMENDATION

THE RECOMMENDATION IS TO REQUIRE IN-BAND INTEROPERABILITY, THROUGH STANDARDS, DEVELOPED THROUGH A LIMITED NUMBER OF COALITIONS OR CONSORTIA, BUT PROVIDING MAXIMUM COMPETITIVENESS AMONGST ALL VIABLE ENTRANTS, AND ALLOWING INTERBAND COMPETITIVENESS VIA TECHNOLOGY AND OPERATIONAL EFFICIENCIES. "

3. In the Comments on the NPRM filed by Telmarc Telecommunications, Inc., on November 9, 1992, TTI presented the reiteration of its prior argument filed in repose to the Pioneer Preference filing, specifically;

" OPTION 5.1

IN AN OPEN-MARKET ALTERNATIVE, AGREEMENT TO STANDARDS CAN EVOLVE WITHIN A LOOSE COALITION OF THE SAME-BAND PROVIDERS IN DIFFERENT CITIES.

Loose national coalitions are very typical. For example, in the 800 MHz band the Cellular One coalition is a Branding approach that includes commonality of some service offerings. If a similar approach could evolve around common technology alternatives, then allocation to loose coalitions is one approach to balance innovation and competition, with the needs for seamless service and interoperability. It is suggested that such a natural clustering of interests is possible and that the Commission should support this. This approach should be aggressively supported in two ways. First, filings on consortia should receive further preference, and second, the anti-competitive nature of such coalitions, delimited by antitrust laws should be reviewed and consideration made to allow such an approach that will be within the context of the overall public interest. The present Commentor has, with other Commentors, agreed to amend their Experimental filings to demonstrate that using QUALCOMM CDMA technology that a national network is achievable. These amendments will be forthcoming, and clearly demonstrate the ability to coalesce around a single standard.

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with the Commission an amendment to its Experimental License on October 1, 1992, requesting that it be allowed to perform a National Trial to clearly and unambiguously demonstrate that a Seamless Interoperable National Network was achievable within the context of such a Consortium. [4] This modification was supported by several other Experimental License holder who have also cross filed for the National Trial, such filings now being in the hands of the Commission.

POSITION ON A NATIONAL LICENSE

Therefore, the Commentor has clearly and unambiguously indicated its agreement with MCI and in fact has precedence over MCI in publicly announcing the concept and in drawing other Experimental License holders to such a venue. However, the Commentor stopped short of suggesting that the National Consortium should be the National License holder as has been suggested by MCI. The

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4. In its amendment to its license filing, and the license having been awarded, Telmarc Telecommunications has filed and has been granted a license to test and demonstrate a national Network. That license amendment was filed on October 1, 1992, and awarded and approved on December 1, 1992. Specifically;

" *The Licensee seeks to amend its current experimental license, KM2XHE, currently permitting the licensee to operate in Boston, to be able to operate in a set of other locations, to be specified and appended to this license, from time to time, for the purpose of demonstrating the capability of establishing and operating a national seamless interoperable PCS network. The Licensee requests that the Commission authorize it to operate up to twelve (12) of the Licensee's licensed terminals to be used in another location or locations, wherein other PCS experimental licensee now operate, with their prior written consent, such consent to be reduced to a written form and appended to this license amendment.*

The Licensee has previously requested from the Commission a License to operate an Experimental Test in the Boston area for the purpose of addressing several key technical factors in the ability to effectively deliver a PCS service offering. Another set of the objectives is best attained through demonstrating the ability to operate the service in a cross market fashion. This implies that the terminals, devices, systems and services, of the Licensee's in Boston are interoparable with other licensees in other cities. As such, the Licensee has ammended its license filing to request the ability to operate its terminals in the following markets, with additional markets to be added as required to expand the test to ultimately demonstrate national coverage, specifically:

(1) Miami

(2) San Diego

(3) San Francisco

(4) Los Angeles

(5) New York

and other cities as to be notified."

Commentor agrees that such a proposal is a natural progression of the Commentors current position and that of several of the other Experimental License holders.

MCI has explicitly proposed that:

> "Each license consortium would be composed of and owned by both a technically sophisticated national entity and local operators. The national manager would provide network services, technical standards, national marketing, and national roaming and inter-operability among the systems. Other qualified companies would build and operate most of the local systems."[5]

The MCI proposal has several elements as described:

(1) National Entity: The assumption is that there is one and only one national entity that is the owner and holder of record of a single national license, and that the Entity is owned by a group of independent companies, entrepreneurs or other entities.

(2) Local Operators: Local operators are defined as the entities that must finance and operate the local systems. As the Commentor has stated before, the local entities are the entities envisioned in prior proposals in filings.

(3) National Manager: The Commentor has proposed a National Manager in its filings in the NPRM Comments. Specifically it suggested that MIT Lincoln Laboratories, with whom the Commentor has a Cooperative Research and Development Agreement (CRDA), could act as such an entity.[6]

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5. See MCI COMMENTS on the PCN NPRM, dated November 9, 1992.

6. The Commentor in the NPRM COMMENTS stated the following concerning the Commissions concerns about standards and a Manager:

"(ix) The ability to provide a service that has the capability of ensuring a seamless interoperable network is based upon the ability of a set of service providers to agree in a coalition fashion on a common set of access schemes and access methods. This can be achieved, as already stated, by economic forces and not necessarily mandated by fiat. The example of the existing coalition discussed in this Preliminary set of Comments clearly demonstrates this fact. Standards are then obtained in the most efficient fashion by market forces and not by market dominance. The lack of an AT&T like entity makes this approach the first time such an evolution will have occurred in any country. The Commission has the unique opportunity to clearly demonstrate the capability of U.S. companies to cooperate and agree to work together without the encumbrances of undue supervision and direction. The Commentor support Standards de facto rather than Standards de jure.

The Commentor also recommends that a national Wireless Technology Resource body be established that will provide a common ground to discuss, analyze, develop, evaluate and generate new technologies and standards for this industry. The Commentor has previously suggested that an institution currently performing DoD research in similar areas may be the proper vehicle for such a focus and the Commentor has specifically recommended the MIT Lincoln Laboratory for such a role. Thus the Commentor suggests that at the current time, economic and technical forces will result in a Standard de facto and that there is a clear and compelling need to establish a National Resources Technology Body and the the time is ripe to move DoD competence into the commercial sector. As such the Commentor recommends that an institution such as MIT Lincoln Laboratory be used as that vehicle.

The MCI proposal has significant merit with some minor modifications. Specifically these modifications should be:

(1) The Consortium should be formed on a open and equitable basis and no one party should have a dominant ownership position. Such an position may result in a chilling effect on the other parties. The Consortium should have the ability to reflect the broadest collection of participants and should not be exclusive.

(2) The Manager, qua Technical Support, should be selected for their professional expertise in this area and should have clear technical excellence.

ISSUES OF SCALE AND SCOPE

The FCC has issued an OPP Report concomitant with its NPRM filing that raises issues of scale and scope economies in the PCS business. The Commentors takes exception with the conclusions reached and hereby presents a rebuttal and in so doing raises questions to the issues that the Commission discussed in that report. Specifically, the Report demonstrates that economies of scale are de minimis but that economies of scope are significant. The Commentor shall use as reference, materials submitted by the Commentor to the Commission as part of their NPRM filing and in a separate fashion directly to OPP.

The operations of a communications system involve the use of capital resources, namely those items depreciated, and expense resources, namely those expensed as used. A system has scope, if for any set of these resources, and if the resources are used in other operating entities, and that by having them bundled together, there result in lower total per unit costs, depreciation plus expenses. Namely, if an entity has existing switching or interconnect, then that entity may provide additional switching or interconnect at a unit cost lower than an entity that must create such elements. The assumption used by the Commission in its report was that in these two specific areas

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RECOMMENDATION 8:

IT IS RECOMMENDED THAT THE COMMISSION ALLOW TECHNOLOGY TO BE USED TO RESPOND TO THE OVERWHELMING MARKET FORCES, DRIVEN BY QUALITY AND COST, TO CREATE AND SUSTAIN, DE FACTO COALITIONS TO ASSURE COMMONALITY OF SERVICE AND THE ESTABLISHMENT AND SUSTAINMENT OF A SEAMLESS AND INTEROPERABLE NATIONAL NETWORK. THAT THE COMMISSION MOVE WILL ALL SPEED IN LICENSING THE NEW BANDS, AND PRESS ALL SUCCESSFUL LICENSE HOLDERS INTO RAPID DEPLOYMENT OF THEIR SERVICE. THAT THE COMMISSION, WITH THE CONSENT OF THE CONGRESS, SUGGEST, RECOMMEND, AND IF NECESSARY SUPPORT THROUGH APPROPRIATE APPROPRIATIONS, THE ESTABLISHMENT OF A NATIONWIDE PCN LABORATORY, TO ACT AS THE INDUSTRY FOCUS FOR THE NEW INDUSTRY, INITIALLY SUPPORTED BY THE GOVERNMENT AND SUBSEQUENTLY TOTALLY SUPPORTED BY THE INDUSTRY. IT IS FURTHER RECOMMENDED THAT AN FCRC, SUCH AS MIT LINCOLN LABORATORY, BE NAMED THAT CENTER OF EXCELLENCE, FURTHER ALLOWING THE TRANSFER OF DEFENSE BASED TECHNOLOGY INTO THE PUBLIC SECTOR, THUS FURTHER MAXIMIZING THE PUBLIC BENEFIT."

there was limited creativity on the part of the new network player. Specifically, in switching, for example, the new player, through the use of new technology may easily eliminate the need for a MTSO or even a Class 5 Central Office. Thus the new player may have a unit cost, even at low usage rates, lower than that of the existing entity. Similarly, the interconnect unit costs have been argued to be lower for Cable or Telco entities. The Commentor argues that this is not only the wrong conclusion but leads to dramatically divergent policy implications.

The existing CATV entities have argued that they have an infrastructure that is highly suitable to use for PCS. The Commentor has previously demonstrated use of this technology but has also clearly demonstrated its severe drawbacks.[7] In a CATV environment there are several reasons for lack of CATV infrastructure:

(1) Interconnect: In a reasonable radius from any large metropolitan area there are one to several dozen CATV entities. The issue of interface and interconnect has never been adequately addressed and there are no standards that allow for this. In addition, CATV switch access uses the same dated architecture as does cellular and thus is highly reliant upon the existing LEC. This will merely drive up the costs of goods for the carrier.

(2) Availability: CATV systems have system availability numbers that are less than 90%, whereas communications networks have availability numbers in excess of 99.5%. The inherent structure, operations and management of the two networks are currently incompatible. Specifically CATV, as currently operated cannot provide toll grade quality service.

(3) Bandwidth: Bandwidth in a CATV system is limited, except on Institutional loops. Local bandwidth is structured for video and the two way systems have limited return path.

(4) Performance: Data transmission performance on coaxial or fiber/co-ax has been shown to have significant problems due to an excessively noisy environment resulting from many open cable access terminations in homes of current or prior subscribers. Admittedly this may be ameliorated but it will require significant rebuilds as well as management and administration of the subscriber loop.

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7. See McGarty, T.P., R. Veith, Hybrid Cable and Telephone Networks, IEEE CompCon, 1983. and, McGarty, T.P., S.J. McGarty, Impacts of Consumer Demands on CATV Local Loop Communications, IEEE ICC, 1983.

(5) Unactivated Two Way Returns: Two way cable almost ceased to exist as an operating entity with the demise of the famous QUBE system. [8] Currently there are less than 0.1% of the CATV systems with active and operational cable return paths and supported bi-directional amplifiers. For the CATV system to function this must be addressed.

Having addressed the above five issues with CATV, the Commentor presents to the Commission the conclusion that CATV is theoretically an alternative but it requires massive rebuild and restructuring. Once that is accomplished, the Commentor argues that the incremental and allocated unit costs will be greater than those of alternative technologies presented elsewhere.

As to the LEC ability to use its existing plant, the argument has two elements. First, prima facie, the LEC plant capital is currently in excess of $1,500 per subscriber, most of that in outside plant. Thus, based upon the Commentor's prior showing, and most recent Ex Parte filing with the Commission, the current state of the art PCS technology provides the service at less than $100 capital per subscriber. [9] Thus, the first observation is that new PCS technology, such as CDMA with intelligent Class 4 connectable cell controllers, has leap frogged that of the telco base. The second observation is made indirectly by looking at the Bellcore technology proposal. [10] In the current Bellcore model, the TDMA proposal is for many small microcells still highly dependent upon the LEC network. The Bellcore approach "allows" the PCS carrier to move outside of the house but still the new PCS carrier and the consumer of the service must be burdened with an antiquated technological base. The Bellcore approach attacks the credibility of the new technology, specifically CDMA, since this new technology obviates the need for local loops as well as local switch concentration and thus threatens the monopolistic bottleneck of the LEC.

Thus the Commentor argues that the Commission's assumptions on LEC scope should be viewed rather as potential or possible barriers to entry to new competitors. The LEC infrastructure is, at even marginal rates, more costly than the new technology, and the LEC proposed architecture imposes the unnecessary burden of access fess for the existing network on the new PCS providers.

The Commentor thus argues that the Commission must recognize that existing providers of transport have neither the most effective

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8. See McGarty, T.P., G.J. Clancy, Cable Based Metro Area Networks, IEEE Jour on Sel Areas in Comm, Vol 1, No 5, pp 816-831, Nov 1983. and McGarty, T.P., Local Area Wideband Data Communications Networks, EASCON, 1982.

9. See TTI Ex Parte filing of December 21, 1992, based on presentations made to the OPP on success criteria for PCS. Specifically TTI showed that $100 capital per subscriber was achievable and that further disaggregated telco access was essential.

10. See Cox, Wireless Network Access for Personal Communications, IEEE Communications Magazine, December, 1992, pp. 96-115.

architectures nor the existing capacity to cost effectively provide any service element in the best public interest.

SCOPE IN CAPITAL PLANT

The Capital required for a PCN operation consists of the following elements; Cells, Interconnect, Switching, and Management. The use of alternative capital elements provided by third parties on a fair and equitable basis results in loss of economies of scope in the capital base.

The capital elements combine to result in a depreciation of the form:

$$D(C,I,S,M) = D(C) + D(I) + D(S) + D(M)$$

where the terms represent the respective four elements. Consider the issue of switching. The argument made by the Commission is that if the PCN entity has an existing switching infrastructure then S_p and S_T are the switching requirements for PCN service and T for normal telephone service. It is further argued that if the same entity has both services that scope exists, namely;

$$D(S) = D(S_p)^* < D(S_p)$$

where:

$$D(S_{Telco}) = D(S_p)^* + D(S_T)^* < D(S_p) + D(S_T)$$

where $D(S_k)$ is the depreciation if the service is supplied separately and $D(S_k)^*$ the allocated depreciation if the service is supplied together. It is argued that it is less expensive to sell switching when there is a use of it in another context.

The Commentor has argued elsewhere that if the cell sites use a co-located adjunct processor, as the Commentor has devised and is developing in the context of its Pioneer Preference Filing, and if the LECs are required to sell switch access at equitable marginally based rates consistent with a disaggregated LEC operation, also as presented by the Commentor elsewhere, then a PCN entity can buy switch access at an expense, E(S), that is;

$$E(S) = D(S_p)^*$$

and scope does not exist.

This argument requires that the Commission understand that switching is not a necessary element in PCS and that switching may be obtained from the PCS company itself, the LEC on a disaggregated basis, or from any other third party switch service vendor, be they Class 5 or Class 4 access capabilities. Specifically the Commentor requests the Commission to note that

intelligent PCS cells that hand off voice channels in a DS3 format with accompanying SS-7 formats allow direct Class 4, Toll-Tandem, access. This is a dramatic paradigm shift from past network architectures that were constrained by dramatic investments in outside plant of twisted copper pairs.[11]

The second element of capital is that of interconnect. The Commentor argues and has shown to the Commission the fact that using CDMA it is possible to connect the cell controller and the micro cells or rerads via 40GHz microwave interconnect, doing so with digitized microwave at higher data rates, allowing for full dynamic range and lower interconnect costs. Point of fact, the Commentor has demonstrated clearly and unambiguously before that using CDMA, without a MTSO, it is possible to achieve a capital per subscriber at 50,000 subscriber penetration of less than $100. [12] This is in sharp contrast to the cellular number of $750 and the LEC number of $1,500.

Therefore with regard to interconnect, the Commentor notes that neither the CATV entities nor the LECs have any economy of scope if one considers fully digital microwave backhaul. In fact, it can be shown, that if $D(I_{CATV})^*$ and $D(I_{Telco})^*$ are the respective annual depreciation of CATV and Telco interconnect per user, then $D(I_{MW})$, the microwave fully allocated depreciation per user for interconnect is:

$$D(I_{MW}) < D(I_{CATV})^* \text{ or } D(I_{Telco})^*$$

as has been shown by the Commentor and in comparison to the Commissions report.[13]

SCOPE IN EXPENSES

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11. See McGarty, Alternative Networking Architectures: Pricing, Policy and Competition, (B.Kahin Ed, Building Information Infrastructures, McGraw Hill, NY, 1992), or McGarty, T., and S. McGarty, Architectures et Structures de L'Information, Reseaux 56 CNET, 1992, Paris. In these two works the authors show that architectures and architectural implications are a reflection of the designers world view based upon existing paradigms. Specifically, the Commissions study is mired in a Telco wire based paradigm. Clearly the Bellcore proposals, if deconstructed according to the above work, will show that their design will allow small cell radium and high reliance on the local exchange carrier. In contrast, the new paradigm is de minimis reliance on the local exchange. We argue here and in the referred works that one must look at this deconstructionist view and deal with the changes in technology that dramatically change paradigms.

12. See TTI NPRM Comments dated November 9, 1992. In these comments the Commentor has included a detailed microeconomic analysis of the PCS system. The Commentor further argues that since the Commentor has on its staff the former CEO and two former COOs of two of the top five cellular companies, it alone has the detailed professional, technical, operational, and business knowledge to assert this information. In referencing the FCC Report from the OPP, it is clear to the Commentor that there has been specific and explicit reliance on the data from both the RBOCs and Bellcore for the model. Clearly these entities have vested interests in continuing the potential barrier to entry through high aggregated costs and through the possible preservation of their dated technology base.

13. See TTI Appendix to NPRM Comments, November 9, 1992, and compare to the FCC OPP Report 28, November, 1992. The TTI report details each of the depreciation elements and the OPP Report shows their analysis for the network using an old paradigm of physical interconnect. The OPP report uses an ad hoc propiter hoc argument based upon extensive RBOC and Bellcore input. A re-evaluation of the financial results using the new paradigm leads to drastically different results.

A similar set of arguments can be used to demonstrate that scope does not exist in expense also. Specifically the Commentor will develop the general argument and shall use as reference documents already submitted to the Commission.

The Expense elements of PCS service consist of the following; Sales, Operations, Maintenance, Access, and Installation. There exists no commonality of function that would make for economies of scope in any of these entities.

This implies that the expenses can be expressed as:

$$E(S,O,M,A,I) = E(s)+E(O)+E(M)+E(A)+E(I)$$

The major issue of scope on the expense elements is that of access. Clearly, if the argument as developed above is used, if an entity has switch capacity that is already in place, such as an LEC, then;

$$E(A_{Telco},A_{PCS}) = E(A_{Telco})^{*}+E(A_{PCS})^{*} < E(A_{Telco})+E(A_{PCS})$$

where these are the scope costs and the non-scope costs respectively. However, if the LEC is required, as a monopolistic player in each market, to provide access at equal and equitable rates, as has been argued elsewhere, then;

$$E(A_{PCS}) = E(A_{Telco})^{*}=E(A_{PCS})^{*} = E(A_{Telco})$$

Namely, all access rates are the same. Then and only then will there be fair and equitable market entry.

POLICY IMPLICATIONS DUE TO LACK OF SCOPE

As a result of the above analysis, there are several clear Policy implications that both counter the OPP Commission recommendations as well as add to them. They are as follows:

(1) LEC Disaggregation of Switching, Interconnect, and Retail is necessary for adequate competition in the PCS market. Failure to have the LECs disaggregate switch costs, and to provide the switching access on an equitable marginally based price level will clearly result in a barrier to entry to any other participant.

In the areas of access fees, economies of scope are existent only in the sense that the LECs provide pricing levels in the existing cellular markets that may be viewed in some limited contexts as predatory. Price on access to cellular carriers clearly does not reflect costs. Transfer price of access, internal to the LEC, can be argued to be less than the marginal cost, in certain

circumstances, as has been discussed previously. As such the LEC can possibly present a market bottleneck element in the provision of PCS access and interconnect services.

(2) A National PCS Consortium is not only possible as a direct result of the lack of scope, but that the lack of scope opens the market for many entrepreneurs to provide the most competitive of markets for PCS services. Furthermore, the lack of scope indicates that even for a National Consortium there is no compelling economic argument that states there should be a national Manager. A Manager is a convenience to assure quality not a necessity to ensure Pareto efficiency.

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REQUEST OF COMMENTOR

WHEREFORE, the Commentor hereby respectfully requests that this filing, being a Response to the Commissions Docket 92-333 and 90-314, be considered as part of the overall deliberations entered into by the Commission regarding the issuance of license for the purpose of providing PCN services. Moreover, the Commentor requests that the Commission recognize and incorporate a process of analysis, that leads unambiguously and consistently to a set of conclusions to the questions posed by the Commission in its NPRM. The Commentor hereby requests that the positions that it has taken, resulting from a direct and exact application of this process, be considered for incorporation into the Final Proceedings of the Commission in this matter.

Respectfully submitted,

TELMARC TELECOMMUNICATIONS, INC.
JANUARY 7, 1993

By: _____

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Dated: January 7, 1993

ORIGINAL January 8, 1993

CERTIFICATE OF SERVICE

I, Anastasia Vournas, hereby certify that a copy of the foregoing pleading has been sent by hand delivery (*) or by United Sates mail, first class and postage prepaid, to the following on this 8th day of January, 1993:

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Chairman, Federal Communications Commission
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The Honorable James H. Quello*
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ORIGINAL January 8, 1993

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Attested to this day, January 8, 1993,

Anastasia P. Vournas

Anastasia Vournas,
Executive Vice President
and
Secretary,
Telmarc
Telecommunications Inc.